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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,675	08/25/2003	David L. Brown	DP-308419	2914
22851	7590	03/23/2005		
DELPHI TECHNOLOGIES, INC. M/C 480-410-202 PO BOX 5052 TROY, MI 48007				
			EXAMINER PHAN, THIEM D	
			ART UNIT 3729	PAPER NUMBER

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)	
10/647,675	BROWN ET AL.	
Examiner	Art Unit	
Tim Phan	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 17-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/12/04 & 8/26/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicants' election without traverse of Group I-A, Claims 1-16 filed on 2/11/05 is acknowledged.

The Restriction mailed on 2/28/05 has been carefully reviewed and is held to be proper. Moreover Applicants did not distinctly and specifically point out any error in the Restriction Requirement. Accordingly, Claims 17-36 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Groups, there being no allowable generic or linking claim.

The Restriction filed on 2/28/05 is hereby **made Final**.

Applicants are required to cancel these nonelected claims (17-36) or take other appropriate action.

An Office Action on the merits of Claims 1-16 now follows.

Title

2. The following title is suggested: "A Method for Making a Dynamoelectric Machine".

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The language "free segment ends on outermost straight portions, said free segments ends having a first cross-sectional shape, said straight portions having a second cross-sectional shape different than said first shape" (Cf. Claim 1, lines 11-13) is vague and awkward. It is unclear and confused if or how the straight portions can be first and second cross-sectional shapes, while having different shape or size.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 3729

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kusumoto et al (US 6,715,199 B2) hereinafter '199.

As applied to claims 1 and 6, as best understood, the '199 teaches a method of manufacturing dynamo-electric machine, comprising:

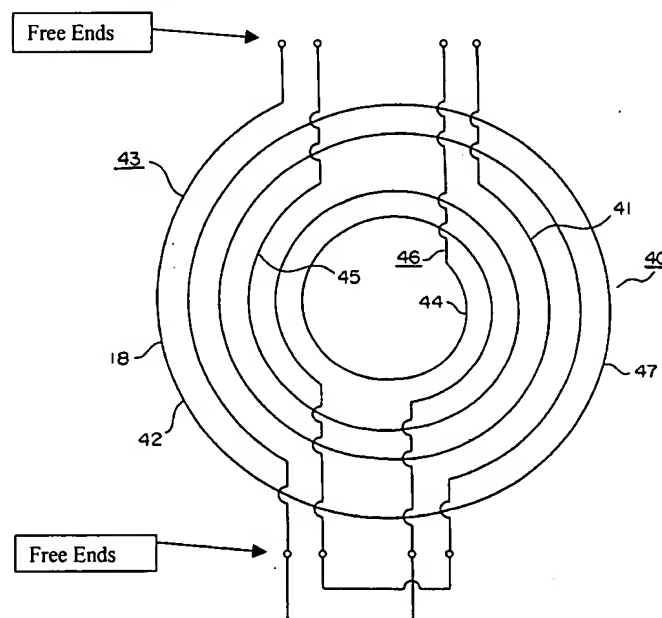
- providing a stator core (Cf. Fig. 1, 11) having a main axis as core center and a secondary axis through the slot bottom (Cf. Fig. 1, 12), said secondary axis being parallel to, and radially offset from, said main axis, said core further including a plurality of teeth (Cf. Fig. 1, both sides of 12) projecting radially inwardly to define a central bore, said plurality of teeth being separated by intervening slots (Cf. Fig. 1, 12) having slot openings (Cf. Fig. 1, 16);
- forming a continuous wave-shaped conductor (Cf. Fig. 5, 18) segment out of a continuous conductor, said wave-shaped conductor segment having a plurality of straight portions (Cf. Fig. 5, 18a) extending longitudinally along and parallel to said secondary axis, a plurality of end-turn regions extending transverse (Cf. Fig. 5, 18b) said secondary axis and disposed in between said straight portions in an alternating pattern so as to define a pair of free segment ends (Cf. Fig. 9, see below) on outermost portions, said free segment ends having a first cross-sectional shape, said straight portions (Cf. Fig. 6, 18a) having a second cross-sectional shape different than said first shape, and said end-turn

regions having a third cross-sectional shape (Cf. Fig. 5, 18b) different than said first or second cross sectional shapes (Cf. Fig. 5, 18a); except for having free segment ends on outermost portions as first cross-sectional shape of straight portions and

- inserting (Cf. Col. 4, lines 47 ff.) said wave-shaped conductor segment so as to be received in said slots at intervals of a predetermined number of slots.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have free segment ends on outermost portions as first cross-sectional shape of straight portions of different or same size as the second cross-sectional shape, extending outside the slots on the same side in order to connect the wave-shaped conductor segments in series for complete windings, since it is known in the art that several wave-shaped conductor segments are connected in series (Cf. Fig. 9, elements 41, 42, 44 & 45; col. 6, lines 1 ff.).

FIG. 9



As applied to claim 3, the '199 teaches the fashioning of the wave-shaped conductor segment so as to span one or more wave cycles (Cf. Fig. 5, 18).

As applied to claim 4, the '199 teaches the fashioning of the wave-shaped conductor segment so as to span $n/2$ wave cycles wherein n is an integer greater than or equal to 1 (Cf. Fig. 5, 18).

As applied to claim 5, the '199 teaches a method of manufacturing dynamo-electric machine, which reads on Applicants' claimed invention, except for fashioning the wave-shaped conductor segment in a manner in which $n=7$.

It is mere matter of design choice to fashion the wave-shaped conductor segment in a manner in which $n=7$ and it appears that the invention would perform equally well with other number n that depends on the slots number of the stator core size.

As applied to claims 7 and 8, the '199 teaches that the forming the continuous wave-shaped conductor segment out of a conductor having a circular cross section shape (Cf. Col. 1, lines 30 ff.) which is less efficient than the reshaping of the said straight portions of said conductor segment into a rectangular cross-section shape (Cf. Fig. 6, 18a) having a width and a height, and wherein the width of said straight portions is substantially equal to the width of said slot, thereby defining said second cross-section shape that is different than said first cross-section shape of free ends (Cf. Fig. 9, see above).

As applied to claim 9, the '199 teaches the limiting reshaping of the second cross section geometry to only the area of the straight portion (Cf. Fig. 6A, 18a) that occupies slots (Cf. Fig. 1, 12) upon insertion into said stator core.

As applied to claim 10, the '199 teaches the substep of reforming said end turn regions (Cf. Fig. 6, 18b) of the conductor segment into a rectangular cross-section shape having a major extent and a minor extent, and wherein said major extent (Cf. Fig. 6A, B) is greater than the width of said second cross-section shape (Cf. Fig. 6A, A), and said minor extent (Cf. Fig. 6B, t) is less than the height of said second cross-section shape, thereby defining a third cross-section shape (Cf. Fig. 6A, 18b) that is different than said first cross section shape of free ends (Cf. Fig. 9, see above) and second cross-section shape (Cf. Fig. 6A, 18a).

As applied to claim 11, the '199 teaches the steps of:

- repeating said providing and inserting steps (Cf. Col. 3, lines 48 ff.) a preselected number of times so that all of said slots (Cf. Fig. 3, 12) are occupied by said straight portions (Cf. Fig. 3, 18a) of said wave-shaped conductor segments; and
- connecting (Cf. Col. 6, lines 1 ff.) respective first and second segment ends (Cf. Fig. 9, see above) of the inserted adjacent wave-shaped conductors to form a continuous wave-shaped conductor segment.

As applied to claim 12, the '199 teaches a method of manufacturing dynamo-electric machine, which reads on Applicants' claimed invention, except for the forming of the wave-shaped conductor segment so as to traverse six slots between each of said straight portions.

It is mere matter of design choice to form the wave-shaped conductor segment so as to traverse six slots between each of said straight portions and it appears that the invention would perform equally well with other slots number to be traversed, which depends on the slots number of the stator core size.

As applied to claim 13, the '199 teaches that the inserting of the wave-shaped conductor segment into the slots through corresponding slot openings (Cf. Fig. 3, 12; col. 3, lines 65 ff.) is in a radially-outwardly direction from said central bore.

As applied to claim 14, the '199 teaches the inserting into the slots (Cf. Fig. 1, 12) of the wave-shaped conductor segment (Cf. Fig. 3, 18a) which lay in an axial direction.

As applied to claim 16, the '199 teaches the step of inserting a slot insulating material (Cf. Fig. 3, 17) in each of said slots (Cf. Fig. 3, 12) wherein a combined width of each of said straight portions (Cf. Fig. 3, 18a) and said insulating material (Cf. Fig. 3, 17) is substantially equal to the slot width or bottom surface (Cf. Fig. 3, 12a).

7. Claims 2 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '199

in view of Umeda et al (US 5,998,903) hereinafter '903 or vice versa.

As applied to claim 2, the '199 teaches a method of manufacturing dynamo-electric machine, which reads on Applicants' claimed invention.

The '903 teaches a manufacturing method for the stator winding (Cf. Col. 20, lines 32 ff.), comprising:

- providing said stator core (Cf. Fig. 12A, 32) such that said teeth include unformed tooth tips (Cf. Fig. 12A, 32a) that define said slot openings; and
- deforming (Cf. Col. 25, lines 3 ff.) said unformed tooth tips so as to reduce said slot openings, in order to insert the conductor segments (Cf. Fig. 14, 33a & 33b; col. 25, lines 5 ff.) in a radially inward direction and simplify the installation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two teachings by applying the deforming of the tooth tips, as taught by the '903, in order to insert the conductor segments in a radially inward direction and simplify the installation.

As applied to claim 15, the '903 teaches the substep of cold working the radially innermost portion of said tooth tips (Cf. Fig. 12A, 32a) by pushing them with a machine tool (Cf. Col. 25, lines 3 ff.).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Phan whose telephone number is 571-272-4568. The examiner can normally be reached on M - F, 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TP

Tim Phan
Examiner
Art Unit 3729

CJA
CARL J. ARBES
PRIMARY EXAMINER

tp
March 17, 2005